

NOTE BY COLONEL S. S. JACOB
ON
IRRIGATION IN THE JEYPORE STATE,
RAJPUTANA.

COMPLIMENTARY

Irrigation when begun.

1. Very little appears to have been done in the way of irrigation in the Joypore State previous to the year 1868, although the remains of old works existed here and there in the districts.

The success which attended the efforts of Colonel Dixon in Merwara shewed what great benefits might be derived from storing water in suitable places, and encouraged Colonel Jacob to try and do something in the same way for the Jeypore State. Wherever he went in the districts, he noticed that water was the great want and how ready the villagers were everywhere to welcome such proposals.

Irrigation Progress.

2. In 1868 the expenditure was only Rs. 227, but a beginning had been made, and the attention of the Durbar having been directed to irrigation, sanctions were given as new projects were brought forward. Every year the expenditure increased, until in 1885 the amount was Rs. 4,28,511.

Since then the expenditure has decreased, and in 1890 was Rs. 1,13,767. Much has been done, but a great deal yet remains to be done.

Expenditure incurred and Revenue.

3. A reference is requested to Statement A. on the next page, which shows the amount expended, the revenue realized annually, and the total up to the end of 1890, the areas irrigated, and the percentage, viz., 9·4, which the returns bear to the total outlay.

It should be observed that this expenditure includes money which has been laid out on surveys of several works which have not yet been taken in hand and other items which cannot be classed as remunerative. As detailed on page 8, Appendix D, if the total, viz., Rs. 1,50,179 is deducted, it reduces the capital outlay to Rs. 32,45,317 ; then, if the revenue for 1890, Rs. 3,19,072, is calculated on the net total, the percentage rises from 9·4 to 9·8, which is very satisfactory.

A.

STATEMENT showing the Expenditure incurred on Irrigation works, Revenue realized, Area irrigated, and average percentage each year since 1868.

YEAR.	Amount expended.	Revenue realized.	Area irrigated in bighas.	Percentage of Revenue on Expenditure.	REMARKS.
1868	Rs. 227	Rs.	Rs. .....	.....
1869	23,853	.....	.....	.....
1870-71	22,772	.....	.....	.....
1871-72	44,529	.....	.....	.....
1872-73	68,019	4,387	.....	2·7	
1873-74	63,590	5,623	.....	2·5	
1874-75	52,690	15,919	.....	5·7	
1875-76	70,452	6,448	5,390	1·9	
1876-77	2,26,038	10,649	9,833	1·8	
1877-78	1,52,663	22,590	17,899	3·1	
1878-79	1,25,218	21,900	14,117	2·5	
1879-80	1,20,766	66,589	36,045	6·8	
1880-81	1,28,588	79,962	49,184	7·3	
1881-82	1,42,765	65,205	43,896	5·2	
1882-83 9 months.	2,38,624	1,39,281	69,345	9·3	
1883	1,67,207	1,62,065	68,617	9·8	
1884	3,11,440	1,25,730	50,389	6·4	
1885	4,28,511	1,35,117	68,107	5·9	
1886	2,80,592	2,01,600	85,287	7·9	
1887	2,97,408	1,65,778	68,919	5·5	
1888	1,93,357	3,09,775	1,20,537	9·8	
1889	1,22,420	2,74,600	1,11,718	8·3	
1890	1,13,767	3,19,072	1,27,003	9·4	
TOTAL ...	33,95,496	21,32,235			

Total Outlay and Total Income compared.

4. It will be observed that the total outlay, including all charges of the past 28 years, amounts to Rs. 83,95,496, and the total amount realized to Rs. 21,82,235. Although this return includes all expenditure up to the end of 1890 it does *not* include the revenue Rs. 55,220, which is due from irrigation which has taken place since 31st August 1890, and which will raise the total realized to Rs. 21,87,455.

Growth of irrigated areas.

5. It is satisfactory, too, to notice the steady way in which the area under irrigation and the returns have increased.

In 1871-72 the returns were only Rs. 4,337 ; in 1890 they reached Rs. 3,19,072. The area irrigated has increased from 5,390 bighas in 1875-76 to 127,003 in 1890.

The returns include water rate and share of produce, and are taken from the statements submitted by the Raj officials.

In the returns, which are furnished annually, the details are all given, shewing how much land has been irrigated by flow, how much by lift, and the nature and area of the crops.

Works which have been done in connection with Irrigation.

6. It may be interesting to state briefly the actual work which has been done since 1868.

The number of irrigation works which has been completed in the past 23 years is 104 and 13 are in progress. Of this number 42 were old, mostly unserviceable works, which have been restored, and 62 entirely new works.

A statement has been prepared and printed, which shews the nature of these works, the drainage areas, the capacity of each tank, the lengths of the main and distributary irrigation channels, the areas capable of being irrigated from each work, and the total expenditure and returns on each work.

It will be seen that the total length of main duct up to date, is 361 miles, and of subsidiary ducts or Rajbahas is 486.96 miles.

All these works are provided with masonry outlet sluices and most of them are furnished with gun metal outlet valves.

The channels are provided with masonry road or footway bridges and falls, and sluices for the distribution of the water where necessary ; the sluices are regulated by wooden planks *sliding in cut stone grooved pillars.*

Plans and Estimates which have been prepared.

7. Every work, in the first instance, has been surveyed, plans, and designs prepared, and estimates submitted.

The registers in the Office of the Executive Engineer shew that—

427 plans have been prepared.

996 estimates have been submitted.

The principal projects, eight in number, have been printed in pamphlet form for record.

Irrigation Department organised and Rules framed.

8. In addition to this, rules have been drawn up for the guidance of the Irrigation Department and of the civil officers in the districts, and, after approval of the Durbar, have been printed. A regular establishment has been organised, consisting of two zillahdars of alpashis (each taking charge of half of the State) and malafizan or guards for every work. These men are provided with printed books, in which the details of the land irrigated are daily, approximately, entered. After each irrigation season, irrigation lands are systematically measured up, and the details are entered in printed forms, copies of which are given to the zemindars and to the tehsil officials, whose duty it is to recover the amounts from the zemindars and remit them to the Raj Treasury.

The zillahdars of alpashi make frequent tours to watch the progress of irrigation, to attend to any complaints, and to make themselves acquainted with the requirements of their districts. After each irrigation season the zillahdars submit statements to the Raj shewing the results of irrigation in their districts.

The introduction and organisation of a system like this cannot fail to have a good influence on every one in the State.

Advantages derived from expenditure on Irrigation Works.

9. As all irrigation works in Rajputana depend entirely upon the annual rainfall, in years when there has been a scanty fall of rain, some of the tanks may not fill, and the returns will vary : still this very uncertainty proves the necessity of storing all the water that does fall, and the following few facts are sufficient to shew some of the advantages that follow from doing so :—

- (a). If it was not for the works which have been made, nearly all the water now stored by these works would be lost to the State. The total quantity of water which can be stored in tanks annually amounts to about 93 millions c. st., and allowing 40,000 c. st. of water as sufficient for three waterings of one bigha, there is enough water to irrigate 232,495 bighas=77,498 acres.
- (b). The money laid out has been nearly all spent in the Jeypore State and among the Jeypore people, and money in circulation, even if it does not show a direct return, must do good indirectly in many ways. In the present instance it shews a direct return as well.
- (c). Expenditure on irrigation works is proved by experience to be one of the best investments that the Durbar can adopt. The last annual return on Statement A., page 2, shews over 9 per cent. There is no other expenditure except the Cotton Press, which can shew such profitable results.

- (d). The fact that Rajputana depends entirely on the rainfall, and is subject to periodical years of deficient rainfall, shews the necessity of trying to store up all the rain that does come.
- (e). When water is allowed to flow off the land, it is an *annual loss to the State*. To prove this more clearly, attention is invited to the following Statement :—

B.

STATEMENT showing the approximate quantity of water that goes to waste in six streams annually and the approximate loss to the Raj caused thereby.

No.	Name of Stream.	Drainage area in sqr. miles.	Water available in million c.ft.	Area that can be irrigated in bigahs.	Annual Loss.	REMARKS.
1	Bangunga River	297	1,500	30,000	60,000	Printed Rept. Ramgurh I. Project.
2	Katli River...	409	1,880	37,600	75,200	Jai Samund I. Project.
3	Baila Nullah ...	230	1,058	21,160	42,320	Chapurwara I. Project.
4	Bai do. ...	108	496	9,920	19,840	Aloda Lake Project.
5	Mahashri ...	220	1,012	20,240	40,480	Etakhoi Project.
6	Sainthal Nullah	80	368	7,360	14,720	Project ready.
Total		...	...	...	2,52,560	

The following large rivers have also been examined and surveys have been made, but the projects do not warrant good returns :—

1	Banas River	...	...	8,190			
2	Sabi	...	...	200			
3	Mendha	...	...	360			
4	Gumbheer	...	...	80			

Six nullahs only are taken. From the maps and record of rainfall it is possible to calculate the quantity of water from these six nullahs only, which annually goes to waste. Allowing only $\frac{1}{10}$ of the rain that falls to be stored, and 50,000 c.ft. of water as more than sufficient to irrigate one bigah, it will be seen that there is enough water to irrigate 126,280 bigahs, and allowing Rs. 2 per bigah as the probable return, the value of the water is Rs. 2,52,560. This is now going to waste annually and might become the property of the Jeypore State if it was only stored up.

Similarly there are many other local nullahs, the water of which might be also utilised.

- (f.) The water stored percolates into the soil, and often benefits many wells in the vicinity of the tanks and along the course of the canals, and so indirectly does great good.

As an instance, on the canal from the Boochara reservoir (which stores water 75 feet deep) at the villages of Toda and Tuskola, four miles from the reservoir, the level of the water in the wells has risen about ten feet and the supply of water has largely increased.

The wells here, used at times to fail; they never do so now, and owing to the higher level of the water, a larger area can be daily irrigated from them now than formerly. Wells also that in the village of Dudas were dry are now in use.

- (g.) Waste lands are brought under cultivation. As a proof of how large irrigation works benefit the country in this way, it is only necessary to look at Teda Rai Singh district. This, a few years ago, was the favourite hunting ground of the Nawabs of the Tonk State; the jungle has been cleared, and now thirty-six new khalsa hamlets and eighteen new jagir hamlets have been founded on what was originally waste land, and the area under cultivation here last year was 127,003 bigahs.

This is entirely owing to the construction of Tori Sagar which was completed in 1887.

A list of these villages is given on page 9.

Suggestions for a definite policy as regards Irrigation. 10. Hitherto irrigation has been included in the Budget with other items of expenditure, all perhaps more or less necessary. No fixed policy, however, has been adopted, so irrigation has not been provided for, as it might have been.

- (a.) It is suggested that the expenditure on irrigation should be treated quite distinct.

- {(b.) That whatever sum the Durbar think advisable to devote to irrigation annually should be set apart and be considered as annually available, so that work to this amount may be arranged for annually.
- (c.) Many promising irrigation projects have been prepared, eighty-two in all. The estimates for these have been submitted to the Durbar from time to time, as they were prepared, and merely await sanction. A list containing nine of the largest and most important is attached (marked C.) A copy of this was submitted to the Durbar on 22nd June 1891 in reply to a kaif-yut No. 82, dated 21st June 1891, asking what works could be taken up should it be necessary to open relief works. All these works are good projects, whether relief works are necessary or not.

The course to be adopted now rests with the Durbar.

Colonel Jacob suggests a reference should be made to this list, and whatever the Durbar think best, those works should be taken in hand during the next three or four years, so that a fixed and vigorous policy may be adopted and carried out.

He is confident that the money will be well invested, and that both the people and the Durbar will reap advantage from such a course.

S. S. JACOB, COL.

JAYPORE, 30th July 1891.

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APPENDIX C.

LIST of the most important Irrigation works which are recommended for consideration.

No.	NAME OF WORKS.				APPROXIMATE ESTIMATE.
1	Ramgurh Reservoir	...	...	...	Rs. 7,95,691
2	Chaparwara Tank	...	...	...	4,62,871
3	Alooda Sur (Bai Irrigation)	...	...	...	67,979
4	Bairat Bari ka There	...	...	...	27,025
5	Karili Sagur	...	...	...	36,124
6	Sainthul Sagur at Bussi	...	...	...	1,72,408
7	Etagoi	...	...	...	93,585
8	Garara	...	...	...	35,000
9	Chand Sin	...	...	...	30,000

APPENDIX D.

*STATEMENT showing the Expenditure on works which are not remunerative,
but treated as Irrigation works or in progress.*

NAME OF WORK.	AMOUNT EXPEND- ED.
Amanishali Bund ...	Rs. 4,699
Nahreeka Naka ...	999
Jhallana Bund ...	313
Khatipoora Nahur ...	176
Naila Bagh (Garden) ...	3,843
Ram Sagur Planting and Watering Trees ...	2,024
Gundha Nullah Bund ...	1,826
Boobas Bund ...	108
Ram Sagur Nahur Burjkhana ...	273
Ranggurh Lake Project ...	30,630
Clearing Talkatora ...	28
Gunging Banganga Floods ...	667
Sickroy Protection Works ...	13,908
Banas River Survey ...	7,230
Survey for new Projects up to 81 ...	3,414
Shunker Talao Narima ...	9,377
Sickroy Protection Works ...	2,449
Lanka Ghata Road ...	1,500
Ranggurh Survey ...	205
Jey Samand Survey ...	2,927
Survey for New Projects ...	16,317
Baueria Tank ...	1,644
Burwas ...	654
Kankurwara ...	1,316
Sandla Tank ...	4,202
Basu Bund ...	5,996
Repairs to Tanks at Plaggi ...	966
Irrigation Channel from Bund Punwar to Khorin Village ...	288
Survey for New Projects ...	8,847
Bund Bussoo ...	3,606
Planting and Watering Trees ...	55
Tank at Haripura ...	4,418
Preparing Corewall of Sandla Tank ...	1,956
New Bund at Barthal ...	4,715
Repairing Old Tank at Burwas ...	142
Repairs to Kalmauda Tank ...	2,123
Do. Tanks at Plaggi ...	228
New Bund Bar Solunkhyan ...	2,986
Repairs to Dhupawari Tank ...	833
Bhagwanitgurh Tank ...	2,154
Repairing Tank Baueria at Toda ...	77
GRAND TOTAL RS. ...	1,50,179

APPENDIX E.

The following new hamlets have been founded on waste land below Tori Sagur from which formerly no revenue was realized. The revenue realized in the past three years amounts to Rs. 94,514 :—

NIZAMAT.	TEHSIL.	
Malpura.	Toda Rai Singh.	Bibolao. Sri Rani Nagar. Khedula Khurd. Luxmipura. Subhdundh. Topan. Sandla. Saitiwas. Bas Jeraun. Gangolao. Gadliapat. Udakabas. Sookhniwaspura. Hurbakhtpura. Rammenaspura. Rughonathpura. Ganetha. Kalianpura. Ramgunge, Basbaneria. Jacobabad. Madhogunge. Gopalpura, Musra, Rathwara. Islamipura. Sorinka Bas and 12 Jaghir Hamlets in addition. Sheoshunkurpura. Buldeopura. Rainsingpura. Rampura, Goordialpura. Motilalpura. Maharajpura. Jailma-Bas Chandsen. Rampura Bas Ganwar.
Malpura.	Malpura.	6 Jaghir Hamlets in addition.
Sambhur.	Sambhur. Mozabad.	1. Jacobpura. 1. Bhoraka Dund. 1. Nayagawn.
Gewai Jeypore.	Kalegh.	1. Sri Newaspura. — 54

APPENDIX F.

STATEMENT of Irrigation works carried out in the Jeypore State, shewing total expenditure on each work up to 31st December 1890, and the total amount realized up to 30th August 1890.

No.	NAME OF WORKS.	Total Expenditure up to December 1890.	Total amount realized up to August 1890.	REMARKS.
1	Rathoria Tank at Toda	Rs. As. P. 1,976 10 4	Rs. As. P. 3,729 0 3	
2	Kuroria Do.	8,219 1 6	2,845 7 3	
3	Lambia Do.	1,124 2 4	141 0 9	
4	Bhanbolao Do.	75 4 2	118 5 3	
5	Gangolao ...	5,618 5 2	1,369 10 0	
6	Khedolao ...	3,356 13 10	2,110 2 3	
7	Kenkurwal ...	2,442 10 0	2,728 9 3	
8	Saitiwas ...	5,278 13 4	8,674 12 9	
9	Slubh Dhund ...	5,488 13 10	2,886 12 9	
10	Nasarida ...	15,866 0 9	14,896 9 0	
11	Sandla ...	12,289 0 8	8,060 11 3	
12	Thaonla ...	33,065 2 9	23,836 2 0	
13	Punwar ...	56,389 8 6	16,076 8 0	
14	Ram Sagur Lamba	44,516 6 0	40,086 1 3	
15	Borara ...	2,786 15 9	1,415 11 0	
16	Dhund Tank at Nagur	1,177 8 3	460 14 9	
17	Bhanbolao ...	9,174 14 9	11,179 12 3	
18	Ram Sagur Gunwar ...	68,347 1 8	19,063 3 3	
19	Kirawal Sagur ...	72,882 8 8	15,185 3 0	
20	Naya Sagur Mozamabad	14,117 10 11	64,703 6 6	
21	Bhora-ka-Dhund ...	1,800 18 11	3,468 3 9	
22	Kanolao ...	7,195 6 8	18,810 12 9	
23	Tilolao ...	9,840 7 1	10,230 11 3	
24	Ram Sagur Phaggi ...	3,530 15 5	11,794 9 0	
25	Bhojiali ...	11,766 2 11	10,659 5 0	
26	Kagiyu ...	2,862 2 0	2,220 10 6	
27	Mandi Sur ...	2,940 6 8	340 7 6	
28	Bankiya ...	4,289 9 2	11,402 3 3	
29	Ram Sagur Choroo ...	4,006 10 8	5,563 11 9	
30	Moti Do. Do.	5,435 14 0	406 9 3	
31	Jaitpoora ...	6,558 14 2	7,315 14 9	
32	Rawatwala ...	11,374 0 8	5,917 9 3	
33	Lambia at Chaksoo ...	2,124 11 3	8,538 7 9	
34	Rabaota ...	7,623 10 5	183 4 6	
35	Madlio Singlipura ...	9,758 12 7	249 13 9	
36	Chundlai ...	50,057 5 2	76,215 6 9	
37	Madhiorajpura ...	6,280 9 9	8,199 12 3	
38	Jhirana ...	1,682 11 3	632 6 0	
39	Dhlobolao ...	48,256 7 0	19,868 15 2	
40	Bauikhur ...	2,882 14 6	897 1 3	
41	Bandolao ...	13,738 5 5	3,686 2 3	
42	Bhaosa ...	1,921 8 1	769 0 9	
43	Kala Talao ...	2,520 13 0	2,952 1 6	
44	Ram Sagur, Maun Sagur and Bhao Sagur ...	37,465 4 5	33,784 4 3	
45	Ram Sagur Neotali ...	1,68,221 11 9	62,332 15 3	
46	Raj Bagh ...			
47	Golab Bagh ...			
48	Runjka ...	4,700 4 7	1,03,336 0 0	
49	Mintwali ...			
50	Bumbala ...			

Statement of Irrigation Works carried out in the Jajpore State, &c.—Contd.

No.	NAME OF WORKS.	Total Expenditure up to December 1890.	Total Amount realized up to August 1890.			REMARKS.
			Rs.	As.	P.	
51	Kalegh Sagur	2,44,283 14 11	3,00,970 9 3			
52	Tori Sagur	5,42,981 2 5	2,21,061 11 3			
53	Ditto Water Mill		84 11 6			
54	Khurr Dam	1,10,140 0 11	75,538 6 0			
55	Bangunga Canal	66,890 0 10	28,129 9 9			
56	Ryawala	19,654 4 9	9,519 5 9			
57	Birawa	16,418 14 8	4,062 8 0			
58	Koonthara	10,604 0 5	2,702 0 0			
59	Kho Nagori	2,893 12 0	1,051 6 9			
60	Hoochara	2,97,109 7 10	48,345 2 9			
61	Moran Sagur	1,45,406 5 2	2,91,284 15 0			
62	Mirzapore		4,020 10 6			
63	Nazimwala and Jeoli	13,427 2 7	13,917 11 6			
64	Fateh Sagur	3,042 8 9				
65	Maheshwara	36,380 13 0	58,483 5 6			
66	Hoda Haili	18,825 10 1	9,598 2 6			
67	Moti Sagur	21,566 3 2	6,748 2 3			
68	Goojuri Theekurya	8,338 8 3	1,261 5 3			
69	Koond Moran	1,116 5 0	8,677 11 9			
70	Binori Irrigation Cut	79,156 14 9	1,21,000 5 9			
71	Nahur Khora	6,742 5 0	2,068 12 0			
72	Toda Bhim Caual	658 6 0	1,331 9 9			
73	Jhoouki	2,645 3 11	5,556 4 0			
74	Kote	18,088 1 6	5,451 12 3			
75	Hoorla	4,480 8 7	10,632 3 3			
76	Tilunwala		.....		
77	Ram Talao	6,564 6 9	14,011 2 9			
78	Bara Talao					
79	Niwazwala	201 6 11	1,321 10 0			
80	Johriwala	9,579 7 3	5,620 8 9			
81	Jatwala	9,006 9 7	8,699 3 3			
82	Khari Nadi	12,619 4 4	1,568 6 0			
83	Salaimpore Well	399 0 0	170 7 0			
84	Do. Bund		864 10 9			
85	Shumspore	10,643 8 8	1,344 12 6			
86	Sikundarpore	8,177 1 6	2,827 13 6			
87	Bishen Samand	41,643 9 1	82,316 0 6			
88	Bijoy Sagur Buswali	6,479 14 5	4,188 9 3			
89	Madho Sagur	1,68,930 11 5	24,336 10 6			
90	Jey Sagur Toond	35,372 1 6	4,409 11 9			
91	Bhorati	2,882 12 7	1,205 11 3			
92	Ram Sugur Malarna Chore		12,693 9 0			
93	Doorga do. do. do.	90,666 9 4	11,760 5 3			
94	Dhund do. do.		10,703 9 3			
95	Kharila					
96	Nuglao	8,670 8 4	14,660 14 0			
97	Bhuni Sagur					
98	Naunla	9,262 13 5	522 15 9			
99	Bhankri Tank	1,321 3 3	58 5 9			
100	Gaitolao	4,049 4 10	7,174 0 0			
101	Namolao Bara		1,487 0 3			
102	Do. Chota	1,870 0 11	887 5 6			
103	Sainthul Bund	17,641 4 0	240 10 9			
104	Sindholi	17,045 12 7	9,039 2 0			
GRAND TOTAL		Rs. 29,21,198 2 5	20,92,577 13 8			

